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XV.—*The Natural History of the British Entomostraca*,  
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ment of the British Museum.

[Continued from Ann. Nat. Hist. vol. i. p. 256.]

[With two Plates.]

THE genus *Lynceus* of Müller is the second genus of the group *Cladocera* of Latreille, vide 'Mag. Zool. and Bot.' vol. ii. p. 400. According to Milne Edwards's arrangement it forms the third genus of the Family *Daphnidiens*, Order *Cladoceres* or *Daphnoïdes*. It is composed however of rather heterogeneous elements and requires to be completely reformed.

*Bibliographical history.*—Müller established the genus in his 'Zoolog. Dan. Prodróm.' in 1776, and named it *Lynceus* from its having, according to his idea, two eyes. At the time he established it, no author had previously taken notice of any species belonging to it. In 1781 he confirmed the genus in his work on the "Entomostraca," described nine species, and gave a few particulars with regard to them. About the same time Schrank and Eichhorn both mention an insect, which may perhaps be the same species, and which evidently belongs to this genus. The first of these two authors in his 'Enum. Insect. Austriæ,' 1781, p. 536, no. 1119, describes it briefly as *Monoc. infusorius, testa bivalvi, rostratus, oculis duobus in rostro sitis*, and says it is very abundant in stagnant waters, and is perhaps the smallest of its congeners. Eichhorn gives a figure of his species, says it is distinguished from that "*Wasserfloh*" described by Schæffer (*Daphnia*) in that it has a pointed beak which lies close upon the mouth; that it differs from it in its motion through the water, not by bounds but swimming like other insects in the water, and that it is very common. Vide 'Beytr. zur Naturgesch.' p. 37. t. iii. f. D. 1781. These authors give little satisfactory information however with regard to the genus, and Müller's characters are very indifferent, as will be more clearly shown hereafter. His spe-

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cies, without any original matter, are given by Gmelin in his 'Syst. Natur. Linn.,' 1778; Manuel in the 'Encyc. Méthod.,' 1792; Fabricius in his 'Entomol. Syst.,' 1793; Latreille in his 'Hist. gén. et part. des Crust. et Ins.,' 1802; and Lamarck in his 'Hist. Nat. des Anim. sans Vert.,' 1818; but no new species are added. Leach in the 'Supplement to the Encyc. Britann.,' art. Crustacea, 1816, and in 'Dict. des Scien. Nat.,' t. xiv. p. 541, 1819, appears to have been sensible that the genus was an ill-formed one, and splits it into two; but with the exception of this, we have nothing new written upon the genus till Jurine published his 'Hist. des Monoc.,' &c. in 1820. In this work he has given us a few particulars with regard to the question of their having two eyes, their mode of reproduction, &c.; he notices several of Müller's species, describes three or four new ones, and hints at the necessity of reforming the genus altogether. These additional species are given along with those of Müller which Jurine notices, by Desmarest in his 'Consid. gén. sur les Crust.,' 1825, but we have no new information till Milne Edwards published his work on the Crustacea in 1840\*. In this work the author shows the necessity for breaking up this heterogeneous genus and reforming it, but does not make the attempt himself, nor do I know of any further attempt having been made till now.

*Habits and Manners.*—These insects are found in stagnant waters and in slow running streams, amongst the *Lemnæ* and *Confervæ*, &c. which collect in these situations. The males, as far as I know, have not been met with or described, though Müller mentions having seen two, three, and even four individuals fixed to each other and swimming about in that state. Several species are very abundant throughout the spring, autumn and summer, and may be met with in almost every pond and ditch. They are not individually however so prolific as the *Daphniæ*, as they produce only a few eggs, generally two or three only at each laying; with the exception of the *lamellatus* †, which has nearly as many as the *Daphnia vetula*, and is about the same size. Their mode of reproduction is the same as in the *Daphniæ*, the intervention of the male being not necessary for fecundating the eggs of the female. In one species, the *sphæricus* ‡, Jurine obtained by isolating the young successively fifteen generations; and in the *striatus* § he followed up the moultings and generations for nine successive periods. "On the 7th of June he isolated a female which had two eggs; 8th of June, two young ones were

\* The first volume was published in 1834; but the third, containing the Entomostraca, was not published till 1840.

† *Eurycercus lamellatus*, nob.

‡ *Chydorus sphæricus*.

§ *Alona quadrangularis*, nob.

born; 9th, it has moulted and got two eggs clear brown coloured; 11th, eggs are elongated, eye visible; 13th, a second accouchement; 14th, has moulted and has two eggs; 17th, a third accouchement; 19th, has moulted and has three eggs; 20th, a fourth accouchement; 21st, moulted and has two eggs; 22nd, a fifth accouchement; 23rd, moulted and has two eggs; 25th a sixth accouchement; 26th, moulted and has two eggs; 28th, a seventh accouchement; July 3rd, moulted and has two eggs; 8th, an eighth accouchement; 9th, moulted, cannot exactly determine whether it has eggs the insect is so yellow; 11th, moulted, cannot see eggs; 14th, ninth accouchement, young ones dead; 15th, mother herself dead." (Jurine, pp. 155, 156.) The young are born perfect; and even before they are ushered into the world, and whilst still in the matrix, we discern the eye and its accompanying black spot. These insects are said by Jurine to be subject, like the *Daphniæ*, to the formation of the saddle or ephippium; and that in each ephippium there is only one egg, which is placed in the middle of the saddle and makes a projection from it. I have never myself met with an individual having the saddle; and in general I have found those which I have kept very short-lived as compared with the *Daphniæ*. The motion of these insects through the water is somewhat different from that of the genus *Daphnia*. Instead of swimming by short irregular bounds as these latter do, they direct themselves by a rapid motion of their rami and legs straight towards the point to which they wish to go. This was noticed by Eichhorn as already mentioned, who seems to be the only person who remarks it till the time of Jurine, and it appears chiefly perhaps to depend upon the comparative shortness and position of the rami, as the *Daphnia cornuta*, which has also very short rami situated as in the *Lyncei*, has the same kind of motion. [Vide Mag. Zool. and Bot. vol. ii. p. 412.] The food of the *Lyncei* consists of both animal and vegetable matter, and whilst they prey upon animalcules smaller than themselves, they in their turn are devoured in great numbers by insects larger than they are. According to Pritchard the *Lynceus sphericus* is the choice food of a species of freshwater *Nais* which he calls the *Lurco*. "So great is the voracity," he says, "of this creature, that I have seen a middle-sized one devour seven *Lyncei* in half an hour. Five of these were moving about in the first cavity; at the end of that time the other two having passed into the second had become exhausted\*."

*Anatomy*.—In general formation the animals of this genus are very much like the preceding, the *Daphniæ*, the most remarkable point of difference being a small black spot a little

\* Vide Pritchard's Microscopic Cabinet, p. 81.

distance from the eye, much smaller than it, which was considered by Müller as a second organ of sight, and from which he has given the name to the genus\*, and the shape of the head and beak. The shell, or covering which incloses the body, does not consist of two distinct and separate valves, but is open only on the anterior margin, and for a portion of the posterior extremity. The part which we may call the head is harder than the other portion of the shell, and is prolonged, in most of the species, into a sharp and very distinct beak. Belonging to it we find, besides this beak, the *eye* with its accompanying black spot, the two *antennæ*, the *rami*, *brain*, *mouth*, and part of the *digestive canal*. The *eye*, as in the *Daphniæ*, is a spherical body contained in a somewhat funnel-shaped tube, having a semirotatory motion, and consisting of a series of crystalline bodies, in the *lamellatus*† being about twenty in number (Pl. II. f. 2.). The black spot which Müller considers as a second eye, is situate before and at a little distance from the real eye, generally near the end of the beak, almost at the extremity of the body of the animal, and near the root of the *antennæ*. It is much smaller than the eye, has no communication with it, and is immoveable. It is not composed of crystallines, and its situation is not exactly the same in all the species. Jurine says he has only examined it in small individuals, and that in consequence he has not been able to discover its use. He does not appear to have met with the larger species of the genus, the *lamellatus*, in which I have examined this spot, but without being able to discover any use to which it is applied. I quite agree with him however in considering it not to be an organ of vision. Straus considers the upper larger spot alone deserving the name of eye, and that this small black spot is similar to the one which exists in the *Daphniæ*, adjacent to the brain; the relative situation too of which is nearly the same as this black spot in the *Lyncei*‡. As I have said above, we find it in the young before birth exactly as in the adult. The *antennæ* are two in number, and are placed near the extremity of the beak, projecting from its under surface. Each consists of a solid body of a somewhat conical shape and slightly curved, which terminates in six short spines, each of which again gives out a fine seta or bristle (Pl. II. f. 3.). They are not possessed of much motion. The *rami*§ or arms are situate on each side of the base of the head, rather lower than in the *Daphniæ*, and consist, as in them,

\* "Nomen *Lyncei* in 'Zool. Dan. Prodróm,' ex punctis binis ocellaribus, quæ organa visus absque dubio sunt, indicii."—*Entomost.* p. 67.

† *Eurycercus lamellatus*, nob.

‡ Mem. Mus. Hist. Nat. tom. vi. p. 153.

§ *Antennæ* of Müller, &c.

of a single joint at the base which divides into two branches, each having three joints. They are much shorter in all the species than in the *Daphniæ*. In the *lamellatus*\* the anterior branch sends off from the last joint three long filaments or bristles and a short one, and one from the extremity of the second and first joints, while the posterior branch sends off only three long ones and a short one from the last joint. The long setæ or filaments are each furnished with a joint near the centre as in *Daphnia pulex*, and as in it also, are beautifully plumose, while the short ones are neither jointed nor plumose. The use of these organs is the same as in the *Daphniæ*, being chiefly organs of locomotion. The *brain* apparently is the same in situation and shape as in the *Daphniæ*. The *mouth* also is nearly of the same construction. The *mandible* (Pl. II. f. 5.) is a strong organ, articulating superiorly with the body by a sharp and pointed extremity, whilst the inferior extremity is free and unattached, curved a little inwards and rounded somewhat at the tip, which is furnished with several strong teeth. The *jaws* consist each of a strong large plate articulating with the body by the narrow end, to which are attached the muscles which move it. About the centre of its length it takes a sudden curve and descends in the form of a broad plate, which is slightly lunated at the extremity, the edges terminating in sharp points. To the lower edge of its superior extremity is attached a flat squarish plate, which moves simultaneously with the other part and to which it seems firmly fixed†. These organs may be seen almost constantly in motion when the animal is stationary, the motion of the mandibles being pretty quick and oscillatory, whilst that of the jaws is slow, upwards and downwards. Part of the *digestive canal* may be seen also in this upper part of the animal, commencing as in the *Daphniæ* immediately behind the mouth in the form of an *œsophagus* and terminating in the *stomach*, which is situate in the lower portion or body of the shell. The stomach differs somewhat from that organ as seen in the *Daphniæ*, being curved or twisted into one or two complete convolutions near the centre (Pl. II. f. 6.). The *body* of the animal is quite free and unattached within the valves of the shell, except at the superior portion where we see it attached to the posterior edge of the shell by about three broadish muscles. It terminates superiorly in a point near the root of the antennæ, and almost upon the extremity of this point is situate the black spot in front of the eye. A short distance from this the body has an indentation, in which, or rather on its edge, is situate the eye, already described. It then takes a round turn, the edge of which is more or less crenated, and

\* *Eurycercus lamellatus*, nob. Vide Pl. II. fig. 4. † Pl. II. fig. 12.

from it the muscles attaching the body to the shell arise. It now turns inwards for a short distance and then bulges outwards again towards the posterior edge, terminating by a joint in the *tail*\*. The space left where the body turns inwards, between it and the shell, is the *matrix* or place where the animal deposits its ova and where the young remain till ready to be extruded, and immediately above this is situate the *heart*. The tail in all the species I have examined is connected to the body by an articulated joint, differing in this very particularly from the *Daphniæ* (Pl. II. fig. 7.). At this joint we see two setæ arise, which in some species, as in the *lamellatus*†, are beautifully plumose and of considerable length. The tail is then projected upwards, being always within the shell when the animal is at rest. It terminates in two or more strong hooked claws, the use of which seems to be to assist in cleaning the interior of the shell, as the tail is flexible and can be extended to a considerable length beyond the shell. In one or two species it is remarkably long, as in the *macrourus*‡, and extremely flexible, and the motion of this organ is evidently of great use to the animal in assisting and regulating its movements. A little beyond the joint is placed the *anus* or termination of the alimentary canal. The *feet* are five pairs in number. The first pair are the largest, and consist each of a fleshy sort of body, bent a little, strongly ciliated on its upper edge and furnished at its extremity with five long and strong setæ, which in general project a little beyond the edge of the valves (Pl. II. fig. 8.). The other pairs are difficult, from their extreme delicacy of structure and transparency, to be made out. They are very much like those of the *Daphniæ* however in structure, consisting of branchial plates and finely plumose setæ, and have the same functions and uses.

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The characters of the genus *Lynceus*, as established by Müller, are both vague and erroneous. "Antennæ," he says §, "two or four, capillaceous." These characters are incorrect: in none of the species that I have seen are they four in number, being invariably only two, and in none are they capillary, being in all branched and articulated. "Feet eight or more:" this may mean any number, but in none are they eight; they do not vary in any of the species, being in all of them five pairs. "Eyes two:" this we have given our reasons above for thinking incorrect also. "Shell bivalve:" this is not correct, the shell being, as we have mentioned above, not divided

\* The body as described above is particularly well seen in the *Lynceus harpæ*, the *Acroperus harpæ*, nob. Pl. III. fig. 12.

† *Eurycercus lamellatus*, nob. ‡ *Camptocercus macrourus*, nob.

§ The *rami* are the *antennæ* of Müller.

into two separate valves. Leach's characters of the genus are equally incorrect: "two eyes; four antennæ, branched\*." We have stated above the incorrectness of these characters. Straus's characters are equally infelicitous: "Rami with two branches, divided into a much greater number of articulations than in the other genera of this family; primitive stalk very short." He gives as the type of this genus the *sphæricus* of Müller, but these characters do not agree with those belonging to that species, as the *rami* are each possessed of only three articulations. In the *brachyurus* of Müller the rami have numerous articulations, but from Müller's figure they appear to be four in number instead of two. Milne Edwards is the last writer who has characterized this genus. His characters for the different genera belonging to the family *Daphnidiens* he adopts from Straus, taking them from the number of branches and the number of joints to each branch of the *rami*. In *Lynceus* he says, "at least four joints to each of the branches†:" this is decidedly incorrect in all the species we have met with. The subgenus *Chydorus* of Leach, as established by him in 'Sup. Encyc. Britan.,' 1816, for the reception of *L. sphæricus* of Müller, is equally unhappily characterized: "two eyes; antennæ two, in shape of threads." These characters are decidedly incorrect, the *rami* (antennæ) being branched and jointed in that species as well as the others.

We propose for the present reforming this genus as follows:—

### Fam. DAPHNIDÆ.

#### Genus LYNCEUS.

"Rami two, for the most part very short, branched; each branch 3-jointed. Eye single, accompanied with a black spot in front of it. Feet, five pairs. Intestine convoluted. Tail jointed."

1st Subgenus. MACROTHRIX †. "Anterior branch of ramus having a very long seta or filament springing from root of second articulation. Antennæ pendulous from extremity of beak."

1st Sp. *Macrothrix laticornis*. Pl. II. f. 9, 10.

*Syn.* *Daphnia curvirostris*? Müller, *Ent.* t. 13. f. 1, 2.—*Monoculus laticornis*, *Jurine*, t. 15. f. 6.—*Lynceus laticornis*, *Desmarest*, p. 376.—*Daphnia laticornis*? *M. Edwards*, iii. p. 373.

\* The species *brachyurus* of Müller is the type of Leach's genus; but as this anomalous-looking species is one I have never met with, though Leach mentions it as common, I have not been able to ascertain its precise characters. It must form a new genus.

† "Au moins quatre articles à chacune des ces branches," iii. p. 374.

‡ From μακρός long, and θρίξ a hair.

Rami strong and large. Posterior branch having four setæ, three from extremity of last articulation and one from extremity of second. Anterior branch has five setæ, four disposed as in the posterior branch, and one very long one from extremity of first articulation. Antennæ pendulous from extremity of beak, broad, and furnished with three short setæ at their extremities. Eye large, distinctly areolar, and having its accompanying black spot near the root of antennæ. Shell transparent, colourless, smooth, ciliated on anterior margin. Having only met with this species once or twice I have not taken any note of the intestine, but according to Jurine's figure, it is not convoluted as in the other genera. In general appearance this insect resembles very much a *Daphnia*, and accordingly it has been transferred to this latter genus by Milne Edwards\*, though he thinks the species *laticornis* to be the same as the *roseus* of Jurine†.

*Hab.* Along with *Daphnia cornuta* and *Cythere inopinata*, in a pond near Hanwell; also in a pond at Highgate, but is rare.

2nd Subgenus. EURYCERCUS †. "Subquadrangular. Tail very broad, in form of a flat plate, densely serrated."

1st Sp. *Eurycercus lamellatus*. Pl. II. f. 1—8.

*Syn.* *Lynceus lamellatus*, Müll. *Zool. Dan. Prod.* no. 3396; *Entomost.* 73. t. 9. f. 4 to 6.—*Monoculus lamellatus*, Linn. *Gmel.* 3008. no. 62; *Manuel, Enc. Méth.* vii. 733. no. 62. t. 268. f. 21—23; *Fabricius, Ent. Syst.* ii. 498.—*Lynceus lamellatus*, Latreille, *Hist. des Crust.* 208; *Baird, Trans. Berw. Nat. Club*, p. 100; *M. Edwards, Hist. des Crust.* iii. 388.

This is the largest of all the known species of the *Lyncei*, being in old specimens fully as large as the *Daphnia vetula*. Shell of an olive colour, rather square-shaped; ciliated on anterior margin, ventricose in centre, and arched on posterior edge of shell. Beak rather blunt and short. Rami very short compared with the size of insect. Anterior branch with three long setæ and a short one springing from extremity of last,

\* I have elsewhere mentioned that M. Edwards takes his generic characters of the fam. *Daphnidæ* from the number of branches and articulations of the rami. The genus *Daphnia* is restricted by him to those species which have two branched rami, with four articulations in one branch and three in the other. Of course, as this insect has only three articulations in each branch, it cannot enter into the genus *Daphnia* as thus constituted. The *Monoculus roseus* of Jurine we have not met with, but it differs according to his description from the *laticornis* in having no areola round the eye, in colour and in shape of antennæ; it is also larger.

† In Yarrell's 'British Fishes' we have a figure of the *roseus* at p. 93, tom. ii. copied from Jurine apparently, where it is mentioned as being the food of the fish called the Vendace (*Coregonus Willughbii*) caught in Lochmaben Loch, Dumfries-shire.

‡ From *εὐρύς* broad, and *κέρκος* a tail.



and one long one from first and second articulations. These setæ are finely plumose, like those of *Daphnia pulex*, and jointed about the middle of their length. Eye large, contained in an infundibuliform tube, areolar, areolæ about twenty in number. The accompanying black spot is remarkably small, situated almost directly under the eye instead of in front of it, and is somewhat of a square shape. Intestine convoluted, having one complete convolution and nearly a half. The lower part of abdomen or body of animal has a lobe springing out from its edge like a spur. Setæ at joint of tail finely plumose and jointed at about half their length. Tail very broad, lamellar, densely and strongly serrated on lower edge, sinuated deeply on anterior margin, and terminating in two stout claws and two small ones. Antennæ are stout solid bodies, somewhat conical in shape, slightly curved and terminating in six short spines, each of which gives out a fine seta or bristle. They are not possessed of much motion. The mandibles are strong, rounded towards extremity, which is possessed of sharp teeth. The first pair of feet consist of a strong fleshy body strongly ciliated on upper edge, and terminating in five long and strong filaments, which generally project outside the shell. The other feet consist of broad plates with the branchial apparatus attached, and resemble a good deal those of the *Daphniæ*. The motion of this species is peculiar; it generally lives at the bottom of the vessel in which it is kept, and when disturbed it bounds up by rapid short motions in a curved sort of line, and then returns in the same manner to the place from where it rose. It is very heavy and slothful compared with the other genera, and I have frequently turned it over two or three times before it moved.

*Hab.* Not uncommon in ponds and ditches near Isleworth; "in Yetholm Loch, and in a pond on Beaumont water."—*Trans. Berw. Nat. Club.*

3rd Subgenus. *CHYDORUS*, Leach. "Nearly spherical in shape. Beak very long and sharp, curved almost into the shape of a crescent. Rami very short."

1st Sp. *Chydorus sphaericus*. Pl. II. fig. 11—13.

*Syn.* *Lynceus sphaericus*, Müll. *Zool. Dan. Prod.* no. 2392; *Entom.* 71. t. 9. f. 7 to 9.—*Monoculus infusorius*, Schrank, *En. Ins. Aust.* 536. no. 1119; *Eichhorn*\*? *Beyt.* t. 3. f. D.—*Mon. sphaericus*, Linn. *Gmel.* 3008. no. 60; *Manuel. Enc. Méth. Hist. Nat.* vii. 732. t. 268. f. 15—17; *Fabricius*, *Ent. Syst.* ii. 497.—*Lynceus sphaericus*,

\* Perhaps this may be a new species. Müller quotes this figure of Eichhorn for his *Lyn. trigonellus*, but it appears to me to be quite distinct. It resembles the *sphaericus* in shape, except that the inferior extremity of the shell is pointed. Should it prove a new species, I should propose to name it *Chydorus Eichhorni*.

*Latreille, Hist. des Crust.* 207; *Lamarck, An. sans Vert.* v. 128. no. 3.—*Chydorus Mülleri, Leach, Sup. Enc. Brit. art. Crustacea; Dict. des Sc. Nat.* xiv. 541.—*Monoc. sphæricus, Jurine, Hist. des Mon.* t. 16. f. 3.—*Lyn. sphæricus, Desmarest, Cons. des Crust.* 377; *Baird, Trans. Berw. Nat. Club,* p. 100; *M. Edwards, Hist. des Crust.* iii. 386; *Pritchard, Micros. Cab.* t. 8. f. 3.\*

Shell round, smooth, slightly ciliated on anterior margin; of an olive colour. Rami very short; anterior branch has three setæ springing from the extremity of last articulation, and one from extremity of second †; posterior branch has only three from last joint. Intestine convoluted, having one complete convolution and about a half. Tail jointed, and having two stout claws at its extremity; the intestine passing through the joint and terminating in the anus near the claws. Eye areolar, its accompanying black spot pretty large and situated just above the root of the antennæ. Its motion through the water is more like rolling, as Jurine describes it, than swimming. The mandibles, feet and antennæ are very like those of the preceding subgenus. According to Pritchard, “the young play near their parent, and at the approach of danger swim for protection within the shell of the mother, which she, conscious of their feebleness, immediately closes †!!”

*Hab.* Ponds and ditches. Common.

2nd Sp. *Chydorus globosus*. Pl. III. fig. 1—4.

Shell quite globular, a good deal resembling in form the last species, but more completely rounded and nearly six times larger; striated circularly on exterior and upper margin, and dotted with small black spots; the anterior portion of shell is reddish coloured, with a large irregular-shaped dark band running across the centre of shell and occupying about half its extent. The beak is extremely long, and at times appears to lie close to the body. Tail elbowed at the joint and hollowed out immediately before it, terminating in two long claws. Eye large, areolar. Intestine convoluted, having one complete turn and about a half. First pair of feet large. Antennæ large, with seven teeth and seven long setæ§. Rami very short and slender. Anterior branch has four setæ, one from second articulation and three from last. Posterior branch has three only from last joint. The motion of this species is very much like that of a *Cypris*.

*Hab.* Ditch near Richmond; pond near Isleworth. Rare, apparently confined to small patches.

\* In Koch's '*Deutschlands Crustaceen*,' &c. there is a figure of the *Lynceus sphæricus*, Heft 8. t. 2., but it is certainly not the *L. sphæricus* of Müller.

† Pl. II. fig. 13.

‡ l. c. p. 90.

§ Pl. III. fig. 2.

4th Subgenus. *CAMPTOCERCUS*\*. "Ovoid-shaped. Tail long, slender and extremely flexible, serrated."

1st Sp. *Camptocercus macrourus*. Pl. III. fig. 5, 6.

*Syn.* *Lynceus macrourus*, Müll. *Zool. Dan. Prod.* 2397; *Entom.* t. 10. f. 1 to 3.—*Monoculus macrourus*, Linn. *Gmel.* 3008. no. 65; *Manuel, Enc. Méth.* vii. 733. no. 65. t. 268. f. 26, 27; *Fabricius, Ent. Syst.* ii. 499.—*Lynceus macrourus*, Latreille, *Hist. des Crust.* 207; *M. Edwards, Hist. des Crust.* iii.

Of an ovoid shape. Shell pellucid and whitish, finely striated or ribbed longitudinally; slightly sinuated and ciliated on anterior margin. Beak rounded and bluntish. Rami short. Tail very long and slender, with thirteen well-marked serræ or teeth on lower edge, and several smaller ones, terminating in two long and slender claws; setæ short. This organ and lower part of body is extremely flexible, and the animal can twist it completely round in a circle, and then unbending it thrust it far out beyond the shell. Eye small but areolar; accompanying black spot nearly as large as the eye. First pair of feet large. Intestine convoluted once and about a half. Antennæ rather long and slender, the terminating setæ long also. Anterior branch of rami has four long filaments and one short one; one long from second articulation, and three long ones and one short from last. Posterior branch has only three long filaments and one short from last joint.

*Hab.* Ditch near Richmond, pond top of Brazil Mill-lane near Isleworth, and at Highgate.

5th Subgenus. *ACROPERUS*†. "Shell somewhat harp-shaped, terminating inferiorly on anterior margin in a more or less blunt point projecting forwards. Rami rather long."

1st Sp. *Acroperus harpæ*. Pl. III. fig. 7.

*Syn.* *Lynceus harpæ*, Baird, *Trans. Berw. Nat. Club*, p. 100. t. 2. f. 17.

Shell rounded posteriorly, sinuated rather deeply and ciliated anteriorly, and terminating in an obtuse point projecting forwards; strongly striated or rather ribbed longitudinally and somewhat obliquely, giving the shell, which is quite transparent, a good deal of resemblance to a harp. Beak rounded and obtuse. Rami slender, and of considerable length, each branch provided with three long setæ from the extremity of last articulation only. The rami and setæ together extend almost the length of the shell, reaching nearly to the inferior extremity. Tail slender, not serrated on under edge, but marked near the edge with a row of indentations, and terminating in two claws, which are long and slender. Antennæ of considerable length, the terminating setæ being much longer than

\* From *καμπτός*, flexible, and *κέρκος* a tail.

† From *ἄκρος* pointed, and *πέρας* the extremity.

in the other genera. First pair of feet large. Eye areolar, accompanying black spot nearly half the size of the eye, squarish shaped. Upper part of body very rounded and crenated round the outer edge. Intestine convoluted, having one turn and nearly half another.

*Hab.* Pond at Osterly Park; ditch near Richmond opposite Isleworth church; "pond on Beaumont water, and in Dun-glass pond."—*Trans. Berw. Nat. Club.*

2nd Sp. *Acroperus nanus*. Pl. III. f. 8.

Somewhat resembles the last in shape, but is very small, not the seventh part the size, is less transparent, less deeply sinuated on anterior margin and less projecting at lower extremity. The striæ or ribs are not so large, and are disposed in a waved form, obliquely transverse. Anterior margin of shell ciliated. Beak rather long, sharper than in preceding species. Rami slender and rather shorter than in *harpæ*. Anterior branch has four setæ, one springing from the second, and three from extremity of last articulation. Posterior branch has three setæ springing from last joint only. Tail has a gibbous projection about the middle of the lower margin, and is serrated at extremity. Intestine convoluted, one turn and nearly a half. One ovum. In size this species is considerably less than the *Chydorus sphericus*, and is about the smallest of the *Lyncei* that I have met with.

*Hab.* Pond at Norwood Green and near Southall, Middlesex. Rare.

6th Subgenus. ALONA. "Shell quadrangular-shaped, striated. Rami short."

1st Sp. *Alona quadrangularis*. Pl. III. f. 9—11.

*Syn.* *Lynceus quadrangularis*, Müll. *Zool. Dan. Prod.* no. 2393; *Entom.* t. 9. f. 1 to 3.—*Monoculus quadrangulus*, Linn. *Gmel.* 3008. no. 61; *Manuel, Enc. Méth.* vii. 733. t. 268. f. 18 to 20.—*M. quadrangularis*, *Fab. Ent. Syst.* ii. 498.—*Lynceus quadrangularis*, *Latreille, Hist. des Crust.* 208; *Baird, Trans. Berw. Nat. Club*, p. 100.—*Monoculus striatus*, *Jurine, Hist. des Monoc.* t. 16. f. 1, 2.—*Lynceus quadrangularis*? *M. Edwards, Hist. des Crust.* iii. 388.

Shell nearly quadrangular, transparent, of a deep brown colour; strongly ciliated on anterior margin, cilia long; striated or ribbed longitudinally, the striæ or ribs rather distant. Rami short, the setæ also being short. Anterior branch with four, one from second, and three from last articulation. Posterior branch has three from last joint only. Beak rather bluntish. Tail rather narrow, sinuated near extremity and serrated for about half its length on under edge; the serræ or teeth at the extremity being the longest. Terminating claws long. An-

tennæ conical-shaped. Intestine convoluted once and nearly a half, but not so very distinctly visible as in the other genera. Eye areolar. Body rounded at upper extremity as in *Acroperus harpæ*. I had some doubts at first as to this being identical with the *striatus* of Jurine. In his figure the beak is blunter and the tail shorter and rounder-shaped than in my specimens. He gives it the name of *striatus* with a doubt, and remarks, "if this species be the *truncatus* of Müller, as we may presume it is, it must be confessed that its specific name is improper; for the shell is not truncated, it is obliquely striated and strongly ciliated\*."

It is evident that Jurine could never have seen the *truncatus* of Müller, and the *quadrangularis* seems also to have been unknown to him, for the difference between his species (the *striatus*) and Müller's *truncatus* is so great and evident that they cannot be mistaken for each other; while the similarity between it and the *quadrangularis* is so evident, that notwithstanding the slight differences mentioned above, I have little or no hesitation in referring them both to the same species.

*Hab.* Ditch near Richmond, opposite Isleworth church; pond at Osterly Park and near Hounslow; "in the Pease burn, and in a pool on Beaumont water at Yetholm."—*Trans. Berw. Nat. Club.*

2nd Sp. *Alona reticulata*. Pl. III. f. 12.

In size this is perhaps the smallest of all the species of this family, being rather smaller than the *Acroperus nanus*. Shell of a quadrangular shape, rounded a little posteriorly, and nearly straight on anterior margin, which appears free from cilia. The lower margin is obtuse, and the whole shell is closely reticulated. Beak prominent and long, projecting upwards, rather blunt. Rami rather slender; anterior branch provided with four setæ, one shortish from second articulation, and three long and stout ones from last. Posterior branch has three from last joint only. Tail rather tapering towards the extremity, and serrated on inferior margin. Eye large for the size of the animal, areolar. Intestine convoluted, but it is not very easily seen, from reticulated surface of shell. One ovum.

*Hab.* Pond near Southall, Middlesex: Sept. 1842.

7th Subgenus. PLEUROXUS†. "Anterior margin prominent on the upper portion; the lower part being truncated, or as it were cut sharp and straight. First pair of feet very large."

1st Sp. *Pleuroxus trigonellus*. Pl. III. f. 13.

*Syn.* Lynceus trigonellus, Müll. Zool. Dan. Prod. no. 2395; *Ent.*

\* l. c. p. 154.

† From *πλευρόν* a side, and *ὀξύς* sharp.

t. 10. f. 5, 6.—*Monoculus trigonellus*, Linn. *Gmel.* 3008. no. 63; *Manuel, Encyc. Méth.* vii. 733. no. 63. t. 268. f. 24, 25.—*Fabricius, Ent. Syst.* p. 498.—*Lynceus trigonellus*, *Latreille, Hist. gén. et part. des Crust.* p. 205; *Lamarck, An. sans Vert.* 123. no. 2; *Baird, Trans. Berw. Nat. Club*, p. 100; *M. Edwards, Hist. des Crust.* iii. p. 387.

Shell somewhat triangular-shaped and transparent; gibbous on upper portion on anterior edge for about a third of its length, the other two-thirds being truncated, or as it were cut obliquely with a straight sharp edge, and ciliated. Posterior margin gibbous also, and sinuated near lower extremity, which terminates in a square point. Beak long, curved and sharp-pointed. First pair of feet very large; the *pediform organ* of Müller being the first pair of feet. Rami short and slender. The anterior branch has four setæ, one from first articulation, one from second, and two from last. Posterior branch has three setæ, all springing from last joint. Tail gibbous for latter half, and serrated. Intestine convoluted, having one turn and nearly a half. Eye areolar.

*Hab.* Pond near Copenhagen fields; at Osterly Park, Norwood Green and Southall; “pond at Foulden and at Yetholm.”—*Trans. Berw. Nat. Club*.

2nd Sp. *Pleuroxus hamatus*. Pl. III. f. 14.

*Syn.* *Lynceus hamatus*, *Baird, Trans. Berw. Nat. Club*, p. 100. t. 2. f. 18.

“Shell truncated anteriorly and ciliated; upper part gibbous; tail not serrated, gibbous, terminated by two setæ\*; two upper feet large, and each furnished at extremity with a strong hook or claw turned upwards; antennæ† of three setæ each. Approaches *Lync. trigonellus*, but differs from it in the beak being blunted and stronger, in the tail not being serrated, and in the upper feet having the strong hooks‡.

*Hab.* Yetholm Loch, Roxburghshire.”—*Trans. Berw. Nat. Club*.

I first found this species in the autumn of 1835 in Yetholm Loch, Roxburghshire, and afterwards in a pool near Yetholm Bridge, but have not since met with it. The intestine is curved, and the shell extremely transparent.

8th Subgenus. *PERACANTHA*§. “Oval-shaped; the lower extremity of shell slightly curved backwards, and, as well as upper extremity of anterior margin, beset with strong hooked spines.”

1st Sp. *Peracantha truncata*. Pl. III. f. 15.

*Syn.* *Lynceus truncatus*, *Müll. Entom.* 75. t. 11. f. 4 to 6.—*Monoc.*

\* Claws or hooks.

† Rami.

‡ It is only about half the size of *trigonellus*.

§ From *πίρα* extremity, and *ἀκανθα* spine.

